THE SETTING FOR THE BROWN MARSH PHENOMENON: PHYSICAL AND BIOLOGICAL CONTEXT FOR WETLAND CHANGE

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My vantage point on the crises that confront the coastal wetlands of the northern Gulf of Mexico is one influenced by both ancestral attachment and present detachment, by a decade of responsibility for advocacy of the generation and use of science, and by a subsequent decade as occasional advisor and critic. Based on this background I have been asked to set the stage, but, like the rest of you, I remain challenged by the bewildering complexity of the physical and biological processes that shape these ecosystems and determine their future.

The scientific and management perspectives on coastal wetland loss have tended to emphasize either long-term processes, such as delta building and destruction cycles, or recent human activities, such as canals and marsh management. Often lost among these disparate viewpoints is the substantial importance of environmental variability and episodic events. The brown marsh phenomenon commands our attention to the importance of transient events that greatly affect coastal wetlands, including biological outbreaks, hurricanes, droughts, and interannual and interdecadal variations in climate. For example, multiyear trends and cycles in tidal water levels now seem to have been an important factor in the rapid wetland losses of coastal wetlands observed in the 1970's.

The 2000 brown marsh surprise may be but a glimpse into a more uncertain future as humankind's uncontrolled experiment with the Earth's climate system plays out. Contrary to the trends observed over much of the country, precipitation in coastal Louisiana declined during the 20th century, and several climate models predict decreased precipitation together with warmer temperatures and more extended summers along the northern Gulf of Mexico Coast in the 21st century. Clearly our efforts to sustain coastal wetlands into the future must take into fuller account not only the secular trends that we will have to contend with (e.g., sea-level rise) but also the consequences of dramatic transient events (e.g., sea-level fluctuations and changes in the frequency and intensity of storms, droughts, and floods). Maybe, the year 2000 will be seen as not so strange after all.